THE MOTOR AGE

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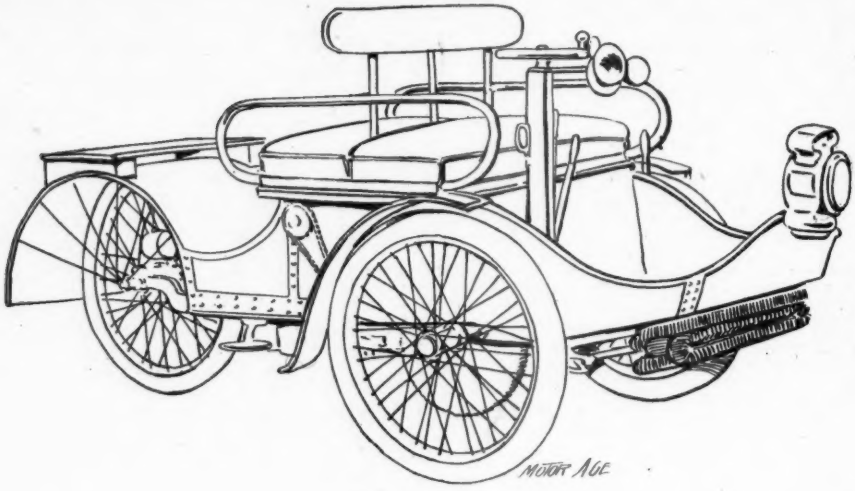
NEW FORMS OF MOTOCYCLES

EUROPEAN BUILDERS ENGAGED IN PRODUCING A NEW TYPE OF LIGHT VEHICLE WHICH CONTAINS FEATURES OF BOTH THE MOTOR-CARRIAGE AND THE MOTOCYCLE

Motor tricycles, much as they have been used in Europe, still present numerous disadvantages. Among these, is the seating of two passengers—when two are carried—tandem-fashion, a none too sociable arrangement, and the vibration to which the rider of the rear seat is subjected. In this form of motor-vehicle, the motor is usually rigidly attached to the frame and the seat is supported on the rigid tubes of the frame with nothing to ease the rider except the small springs of the saddle.

With the ordinary bicycle, or tricycle, a considerable portion of the rider's weight is supported on the feet and hands, thus relieving him of a considerable portion of the vibration that would otherwise reach him through the saddle. On a motocycle he rests almost his entire weight on the saddle and thus gets all the vibration arising from the progression of the machine over the road surface, and, in addition, the vibration arising from the intermittent impulses of the motor.

To overcome these difficulties, and, at the same time, produce vehicles which will be within the financial reach of those moderately situated, several European constructors have built motor-vehicles which are crosses between automobile carriages proper and motocycles. The



"VOITURETTE PY."

ability to secure such vehicles is expected to add a great number to the list of automobile users.

The Voiturette Py.

Among the vehicles of this class, of which there are already a number of varieties, is that of the French "Compagnie des Automobiled du Sud-Ouest," yclept the "Voiturette Py." This voiturette or motocycle, whichever it be, has three wheels, two in front and one at the rear. The front wheels carry the greater part of the weight and are used as driving wheels, the single rear wheel is utilized for steering. The motor, shown in Figs. 1 and 2, is of the four cycle, one cylinder type, with air cooled cylinder, while the valve-box is cooled by a circulation of water effected by means of a centrifugal pump, actuated by the flywheel, drawing the water from the reservoir to the motor and then sending it through cooling tubes provided with radiation fans and then back to the reservoir.

Mechanical Features

The stroke of the piston is twice the bore of the cylinder, giving a long expansion. The crank is counterbalanced, a flywheel is attached to the motor shaft and a friction clutch works in the flywheel.

The carburettor, which has a constant delivery, is shown in Fig. 1. The gasoline is fed through a pipe at a, lifting the rod c and its plate b and then passes through the passage d to the nozzle e; the air enters at g, passes around the plate b, through the passage h and fills the chamber i, where it mixes with the gasoline, which is atomized against the inverted cone f; an additional supply of fresh air, regulated by the driver, is admitted by the valve j.

This explosive mixture is then carried

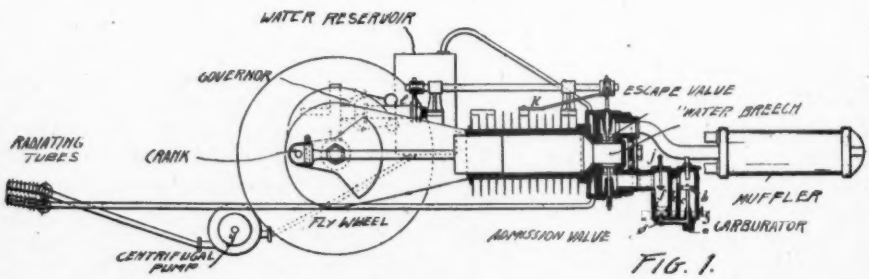


FIG. 1.

to the admission valve, at the lower part of the breech of the cylinder. The escape valve is located at the opposite, upper side of the cylinder where a flat spring k holds it against its valve seat. A cam l on the lower part of the governor shaft lifts the lever m attached to the shaft n. On the other end of this shaft n is an arm o, which, at the proper moment, presses down the escape valve. The burned gases pass out through the pipe p to the first muffler and thence through the pipes p' p' to the second muffler P, escaping through the small holes in the tubes r r.

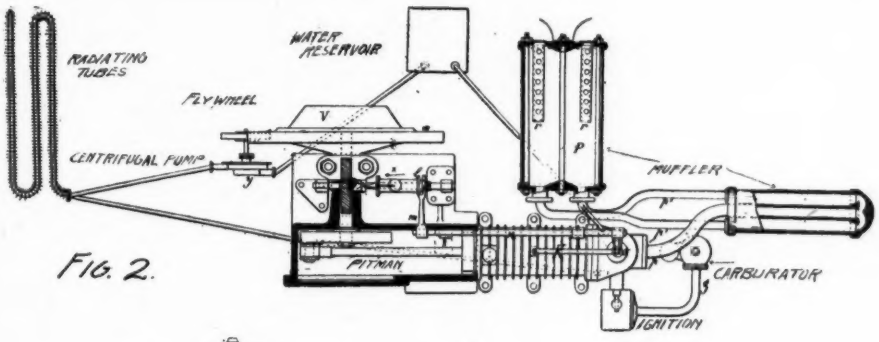


FIG. 2.

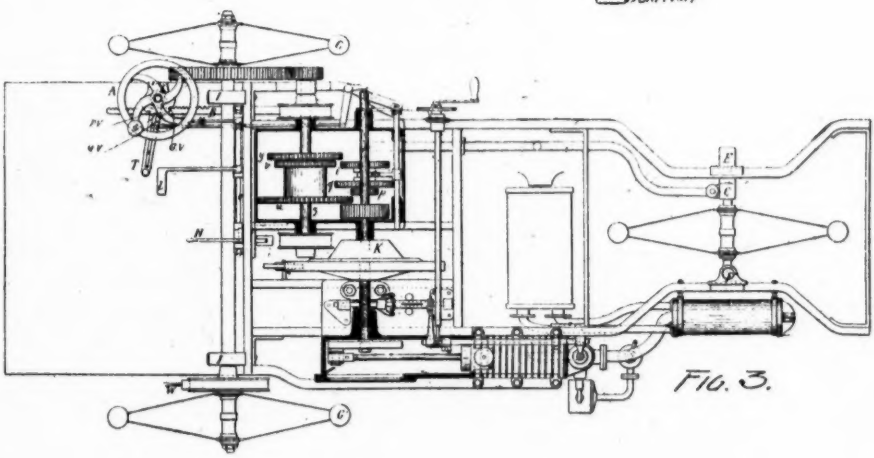


FIG. 3.

Automatic Governor

The motor is automatically regulated. A ball governor, when the speed becomes too high, pulls a socket in the direction indicated by the arrow x so that the cam l does not operate the lever m and the exhaust valve is not depressed, allowing of no escape of burned gases, and, consequently, no admission of fresh explosive mixture. When the speed is sufficiently reduced the parts resume their normal functions.

The power is transmitted from the flywheel, by means of the friction clutch K to the shaft J. By means of the foot lever L the mechanism is thrown in or out of gear, at will. The setting of the foot brake M automatically throws the mechanism out of gear.

Speed Change Gear

The shaft J carries three pinions, p, q and i, for the changing of speed. By moving the speed changing lever I, these pinions can be made to engage the pinions u, v and y on the shaft z. On the end of this shaft z is a pinion engaging with a pinion surrounding the differential gear. The speeds obtained are 5, 8 1-4 and 18 3-4 miles an hour.

The steering is done by means of the hand wheel A which, through a pinion, actuates the rack on the rod B connecting with the rear axle at C. This rear

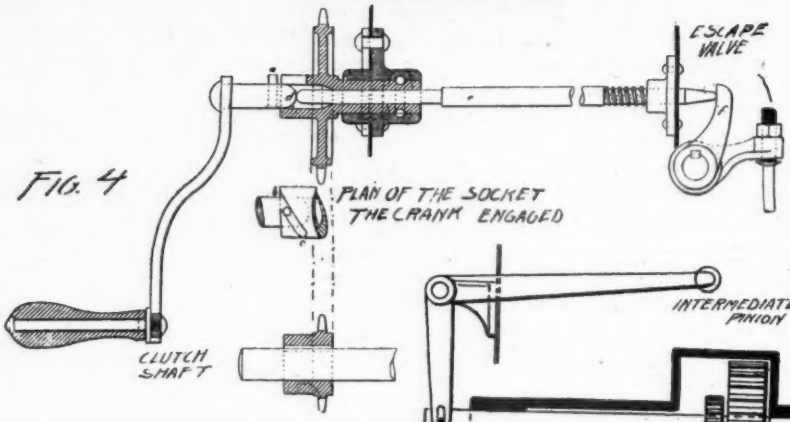


FIG. 4

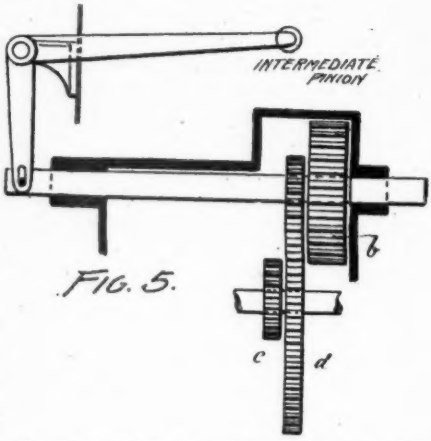
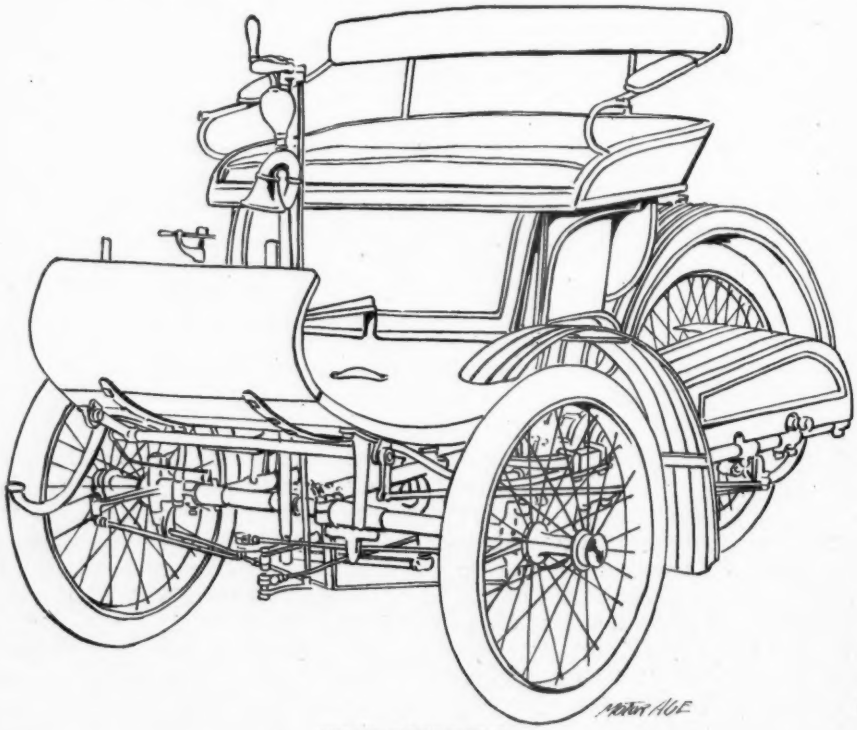


FIG. 5.

axle is pivoted at F and slides on rollers at E, the rear wheel acting after the fashion of a rudder.

The motor is easily started by means of the hand crank shown in Fig. 4. The shaft of the hand crank carries a pin, a, which engages with a helical groove, b c, on a shaft geared to the motor shaft. The helical shape of the groove carries the end d of the hand crank shaft against the rod e, which, in turn, actuates the lever f which opens the exhaust valve, so that there is no back pressure.

The reversing gear is shown in Fig. 5.



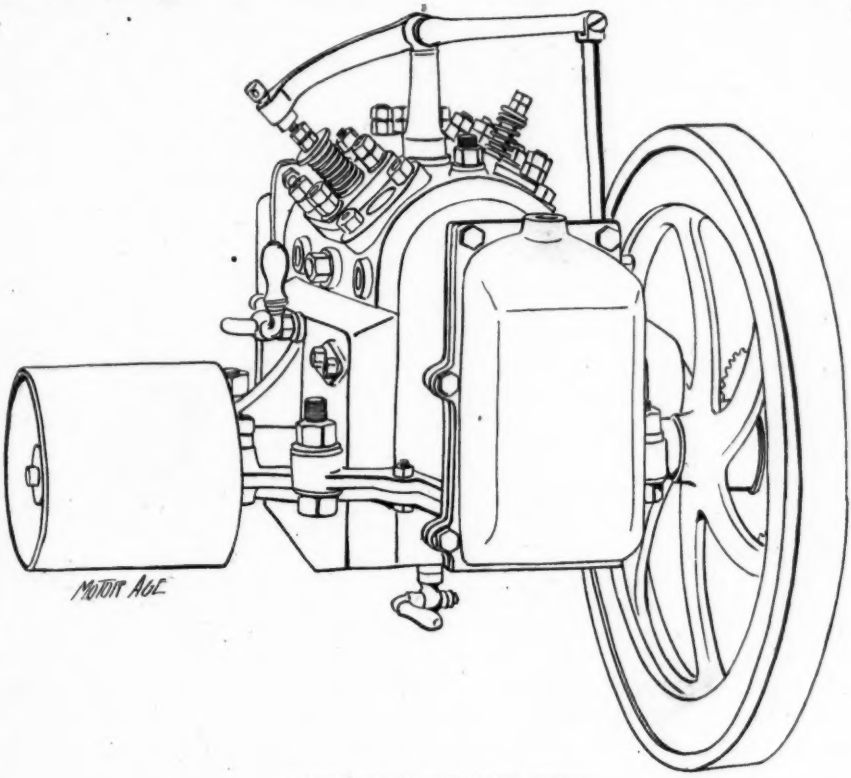
HILLE MOTOCYCLE.

A movement of the lever throws into engagement the pinions b, c and d.

The seat is hinged so as to be thrown back, giving access to the motor and all the driving mechanism.

Manifold Brakes

Three band brakes are provided. The first M, a foot brake, acts on the intermediate power shaft and throws the friction clutch out of engagement; the second N, a hand brake, acts in a similar manner, while the third, W, acts on the shaft of the driving wheels.



MOTOR OF HILLE MOTOCYCLE.

The frame, Fig. 3, is made of steel tubing. The motor is 3 1-2 brake horsepower. Grades of ten to twelve percent are climbed with a load of 650 pounds in the vehicle. The dimensions of the vehicle are about 4 1-2 feet wide by nine feet long. Its stability is good, owing to the lowness of the center of gravity. The vehicle is said to be entirely satisfactory.

Hille's Motocycle

Another vehicle of the same general type, but differing in many particulars of construction, is that made by Maritz Hille at Loebtau, Dresden, Germany. This vehicle is designed for two persons, seated side by side.

Like the one previously described, it has two wheels in front, but, in this case, the steering is accomplished by means of these front wheels and the vehicle is driven through the single back wheel.

A Front Steerer

The front wheels are set on stub axles, after the manner of four-wheeled motor-carriages and the steering mechanism is of the usual type. The front wheels are twenty-eight inches in diameter and the rear wheel thirty inches, all fitted with 2 1-2-inch pneumatic tires. The body is cerried on four elliptical springs.

The three-horse-power motor is entirely enclosed. It transmits its power to a counter-shaft, which is connected with the two-speed gear by means of a belt. The change in speed is effected by a lever which shifts the belt. A hand brake automatically shifts the belt to the loose pul-

ley, and, at the same time, applies a band brake.

The two speeds to which the vehicle is geared may be varied by regulating the speed of the engine by advancing or retarding the ignition.

The vehicle has climbed grades up to seven percent at a speed of seven to eight miles an hour. The maximum speed obtainable is eighteen miles an hour.

The motor is water cooled, the water being carried in a tank around the back wheel. Fuel oil sufficient for ten hours' continuous travel, at top speed, is carried.

A CHAPTER ON MOTORS

Paris, Feb. 20.—A few years ago steam was considered, here in France as elsewhere, to be the only motive power likely to enjoy lasting popularity for purposes where economy had to be taken into consideration, and that it would stifle in the cradle all direct and electric motors. A certain hope rested on the carbonic gas motor, which, indeed, may be revived. Much stranger things have happened.

Still steam has hard work at the present time in competing with the direct hydrocarbon motors, at least here in France—not where large amounts of horse-power are used, but for limited calls for power—especially where ease of installation and comparative simplicity are required. Even now the weak gas engine is becoming a serious competitor of steam.

The most serious objection to steam for the use of motor-vehicles lies in the necessity of having a boiler, which as a rule requires a deal of attention. Still, in Serpollet's, Field's and other light generators of boilers have been brought ao the acme of simplicity and compactness.

And steam presents, with few inconveniences, tremendous advantages, producing a highly elastic motive force, doing away with the necessity of speed changing gears, often cumbersome, and giving immunity from being stalled, which makes it appear that there is a wide field for the steam carriage in this country. At present, however, we have none, if we except the Serpollet, the one shown by de Dion, the American Stanley vehicle and that of the Scotte Steam Bus Co. of England. Beyond these no attention has been paid to anything except vehicles propelled by gasoline engines.

The desire of many motor-vehicle users is to obtain kerosene motors, but up to the present time few carburettors have been devised that have worked satisfactorily with that kind of oil. If such a carburettor were to be offered—one that was thoroughly practical—it would find a ready sale here, although the present demand is largely for the tested gasoline motor, as the carburation by evaporation of the liquid, which is the principle on which most of the carburettors work, affords the simplest and most satisfactory method of obtaining the explosive mixture.

The advantages of the direct combustion motors appeal to the French people, their compactness and the quickness and ease with which they can be started. It is unfortunate that with these advantages they do not possess that of elasticity. The indicator cards, or diagrams of expansion of gas and gasoline engines, are radically different from those obtained from steam engines, the former showing the instantaneous expansion of the gases, giving those hammer-like piston throws so prejudicial to any piece of mechanism. They also necessitate, except in those of comparatively small horse-power, the objectionable water cooling, and likewise involve the use of speed changing gears, all of which afford opportunities for getting out of order and causing delays.

The use of separate combustion chambers has been tried, but, owing to the

instantaneous explosion of the gases, a large amount of energy is lost. Acetylene gas, being of a still more explosive nature, does not offer any hope of relief, giving even more pronounced hammer-like impulses, a thing which everyone concerned with motor construction is trying to avoid.

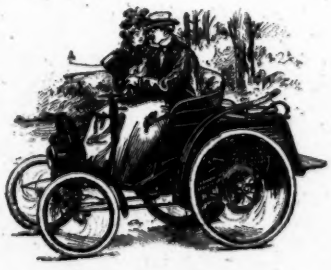
An idea—which, if carried out, would go far toward relieving the difficulty—is that of finding a means of prolonging the expansion in gas motors, without decreasing their power. This would enable them to compete absolutely with steam engines. A few motors have been made with that object in view, one of which, the Marmonnier, should work very well. In any case it is well conceived.

As for electricity, its future is settled. Electric motors, with all their obvious advantages, will certainly give way to motors of other types, a competition that cannot help resulting in advantage to the buying public here. Their cleanliness and absence from noise and vibration are thoroughly appreciated, but the small capacity of the accumulators and consequently limited area of travel of the vehicles employing them, is a greater inconvenience in France than in America, where electric current can be more easily obtained and at a lower cost. In France electricity is produced almost entirely by the use of steam engines and the cost of fuel is so exorbitant that the twice transformed energy is very expensive.

The production of a good thermo-electric battery would give a great impulse to electricity in this country. Clamond and Charpentier have worked on the problem and have obtained some degree of success. Charpentier pursued the subject after it was dropped by all others. What results may eventually be accomplished are problematical, as Edison himself devoted time to it without producing any valuable results. Yet a glorious future awaits the happy man who may be able to achieve success in this line.

Work is being done on chloroform and ether motors and there is also an ammoniac motor. No opinion can be given as to their possibilities. Experiments were carried on of the same kind years ago without success.

To predict what will be the successful motor of to-morrow in the motor-vehicle business is too difficult a task for anyone. There is steam, gasoline, electricity and carbonic acid gas—not to mention that newcomer, liquid air, which it is said will soon be applied to experiments in aerial navigation. In any event, Tripler's motor has created a sensation here, and some of the most keenly scientific members of the Aero Club—a club devoted to the study of experiments, researches and topics generally of interest to aerial navigation—have given it serious consideration.



THE HOLYOKE MOTOR WORKS

Located in the thrifty, busy, manufacturing town of Holyoke, Mass., is the Holyoke Motor Works, at the head of which Charles Gruder. Doing a general foundry and machine shop business, Mr. Gruder has devoted the major part of his time for several years past to experiments on motor-vehicles.

Without disparaging his work, it may be said that he has sacrificed somewhat the appearance of his vehicles to their mechanical efficiency. In this respect he is ahead of the times, considered from the American point of view, which at present stamps with the greatest approval the vehicle which looks most like a horse drawn vehicle with the horse and shafts removed. This might readily be expected, however, in a man like Mr. Gruder, who is a German and has had the experience of the German and French constructors to guide him.

The desire for efficiency has evidently been foremost in his mind and considering the onerous duties of a vehicle on American roads, particularly among the New England hills in the midst of which his factory is located, it is not strange that his desire to build vehicles which would go anywhere, would lead to extremely radical departure from accepted lines. How near he has come to accomplishing his ends may be judged when it is stated that he has on several occasions

HOLYOKE SURREY—FRONT VIEW.

HOLYOKE SURREY—SIDE VIEW.

climbed Mount Tom, a peak of 1,200 feet elevation, with his 2,000 pound surrey.

The general construction of the vehicle can be seen from the accompanying illustrations, which show front, side and rear views, reproduced from photographs. Each of the two seats is designed to accommodate two persons, although they are sufficiently large to permit of their being occupied by three without inconvenience.

The frame is constructed of channel iron, the two side reaches running parallel from the rear axle to a point about two-thirds of the distance to the front axle, where they converge, being pivoted to the front axle in a substantial manner, permitting of an unlimited play for the front wheels.

The motor and the gearing are carried on the channel iron frame without spring support, permitting the body of the carriage to be carried on light springs, nullifying the effects of the vibration of the running gear caused by the vibrations of the motor and the inequalities of the road, without the violent swinging of the body that is inevitable where it has to carry a great weight in addition to its own weight and that of the passengers. The body is carried on four elliptical springs, the forward ones resting on supports directly on the front axle and the rear ones on the rear axle supports. By this arrangement it is possible to fit any style of body to the one style of running gear. A comparatively small supply of water for cooling purposes is carried, the motor being water cooled of course, owing to the efficient cooling device which can be seen under the carriage body in the front view of the surrey. In addition to the tubular water cooler, there are two others at the side of the vehicle body which have the appearance of ornamental panels.

Perhaps the least esthetic feature of the whole vehicle is the steering gear, which at the same time is one of the most effective seen on any vehicle. The time is bound to come, too, when steering devices of this type will come into general use. A rotary shaft terminates at its upper end in a lever provided with a handle within easy reach of the driver. At its lower end it is provided with the

necessary universal joint connecting it with a horizontally disposed disc, having crown teeth on its lower face. These crown teeth engage the teeth of a pinion

Holyoke Surrey—Rear View.

at the end of a horizontal sleeve. This sleeve through a worm gear actuates a horizontal shaft pivoted to the arm of the lever of one of the stub axles, which is connected to the opposite lever by two straight rods attached to a two-arm lever in the center. The arms of the stub axles and lever are set at the proper angle to give the desirable difference in the angles of the steering wheels. The entire mechanism is set in front of the front axle, a disposition mechanically correct but one which does not add to the appearance of the vehicle.

The motor is provided with an automatic governor which regulates the supply of fuel to all loads and speeds. The ignition is from a small dynamo actuated by the motor itself. An efficient muffler is provided which acts so well that the loudest noise heard when the vehicle is in operation is that made by the working of the valves. The combustion is complete, leaving no noxious odors.

Mr. Gruder claims to have the automatic features of his carburetting device so nicely arranged that no manual changes are required for different degrees of temperature and varying atmospheric conditions.

All working parts of the mechanism are constructed with very large bearing surfaces in order to prevent wear, failure to work and replacement of parts.

The company's experimental work has been completed and vehicles will henceforth be built on a commercial scale. To that end the plant at Holyoke is to be enlarged at once.

MECHANICAL TRACTION IN WARFARE

Mr. Bennet Burleigh, the intrepid war correspondent of the London Daily Telegraph, writing from General Buller's camp in Natal on January 2d says:

"Weather permitting, the half-score or so of strong Aldershot traction engines, which have at last been detrained here and at Chievely, will do much toward making General Buller's army compact and mobile. Without them the troops would require an astounding length of ox and mule wagons. The despised ox wagon is slow and sure. Its infallible drawbacks are that it occupies a considerable length of the road, requires guarding with many attendants, and can only be depended upon to haul not more than 600 pounds. Nay, more, if the teams are to carry their own forage, the power of hauling is limited to something like fifty miles.

"With the army entirely dependent upon trek ox wagons, the 1,660 of them, the inconsiderable number for conveying the munitions of this army, would stretch along several miles of road. It will be another affair if the dry weather continues and any great use can be made

of the traction engines. They require few attendants, don't jib, and each can easily haul twelve tons. Yesterday and to-day these wheeling puffing Billees have been running to and fro transporting stores from the railway siding to the respective brigade camps, one of which, Hart's, is two miles away. They leisurely descend into spruits, roll across, and wheel up stiff, long climbs like flies walking up a wall.

"Tacked on to one of the big guns they should, weather permitting, shift it rapidly from place to place, nor are they quite helpless when the ground has been soaked with rain. Clip-irons are attached to the rims of the broad wheels and these dig into the firmer soil and the steamer rolls forward, leaving a wake like a ploughed field. On the flat, dry veldt the steamers trip along at a brisk eight miles an hour."

The superiority of mechanical to animal traction in difficult country is again strikingly exemplified by Mr. Bennet Burleigh a few days later, in his description of the passage of the Tugela. He writes:

"It was a prolonged and desperate scramble to get the men and about 400 wagons and nondescript vehicles down the steep, slippery bank through the waist-deep stream and up the sticky opposite slopes. Three ox wagons were run down into the river and converted into bridge piers; planks being laid thereon, part of the infantry were able to pass over dry shod, but the planks and footing were insecure in places, and it came to be like walking the greasy pole at Ramsgate aquatic sports, for numbers of Tommies went hurriedly into the water in the most diverse and eccentric manner, to the surprise of lots of people.

"The much-laughed-at score of Aldershot traction engines did not stick or flounder in the mud, but lumbered about doing duty with comparative ease and considerable regularity. Their flanged grips upon the wheels gave them a sure bite of the ground, and in one or two places they churned up rather deeply. A by no means overladen wagon stuck in the middle of Blauwkran's Drift, close to Frere Station. Eighty oxen were tried and were unable to move the wagon an inch. It seemed as if the whole column must wait until the vehicle was carted off. A traction engine was requisitioned to try its powers, the enormous span of cattle were taken away, and a steel hawser was passed from the engine and made fast to the disselboom. Then steam was turned and with a snort and whir the steamer walked away with the wagon, conveying it some distance to a high and dry part of the roadway."

Writing on the same subject, the Sheffield Telegraph says:

"The French, thanks to the prejudices and interests which have checked the development of automobilism in this country, have taken the lead in the manufacture of motor cars and their applications. The Scotte traction engine, drawing a train of cars on the road, is giving satisfaction in the French army. Twenty-five of these engines can provide an army of 60,000 men, sixty miles distant, with cartridges in eighteen hours. They can also transport fifty "cannons of twenty-four'—weighing twenty-four tons each—a distance of ten miles in a single night. If the Prussians had had such engines in 1870 they would not have required to wait three and a half months before getting their guns into position for the siege of Paris. According to Moltke, they had to bring 960 wagons and over 2,000 horses from Metz for the purpose. A Scotte traction engine replaces thirty-two horses, and 200 or 300 of them would have enabled the Germans to commence bombarding Paris a few days after the investment began. It is evident that in future wars traction engines and motor cars will render important service."

CONDITION OF BRITISH AUTO TRADE

In a paper read before the Automobile Club of Great Britain and Ireland, the Hon. John Scott Montague gave the reasons for the none too flourishing conditions of the industry substantially as follows:

He prefaced his remarks by saying that in the early days of any industry there is always a difficulty of inducing the private capitalist or the British public to support schemes to manufacture articles of which they know little, and in the success of which they do not believe. Much experimental work has to be carried out, which, though it may mean an expenditure of thousands of pounds, may in the end be absolutely unproductive of commercial results.

In the motor industry this is particularly so, and anyone who has had experience of experimental work in connection with motors knows that experiments and deviation of any kind from the accepted and proved models which have run and performed successfully on the road mean great loss of money and results in most cases insignificant to the work performed. There is also a tendency to attach exaggerated value to patents, which in the motor world are very often not patents at all.

One of the most cruel drawbacks under which a young industry can suffer is that of over-capitalization, and this has been rampant in automobile manufacture. This is all the more regrettable because the British public showed a distinct sign some four years ago of giving support to British motor companies. Today the position is that the British public as a rule are unwilling to place any further funds in the motor industry, and the private capitalist is not yet convinced that the movement has come to stay.

With regard to the question of finance, unfortunately the motor industry had been hampered by a great deal of "bad finance." In 1896 there is no doubt the public was ready to support the industry at its birth.

The Daimler Co. was floated by Harry J. Lawson in February, 1896. There was a rush for the shares. The company purchased certain but not the sole rights in the Daimler patents from Mr. Lawson's British Motor Syndicate for £40,000 in cash. He called it Mr. Lawson's syndicate, because in April of that year Mr. Lawson owned £100,000 of its £150,000 shares. The facts brought to light by the report of the committee of investigation into the promotion of the Daimler Co. were sufficient to make it impossible for any self-respecting man to associate himself directly or indirectly with the person or persons responsible for the Daimler Co.'s prospectus. In May, 1896, Mr. Lawson floated the Great Horseless Carriage Co. with the ridiculous capital of £750,000, of which £500,000 went into the British Motor Syndicate although four months later only £31,160 worth of shares stood in the name of that syndicate. At the end of 1896 the wideawake portion of the British public began to recognize the tricks to which they were being subjected and honest journals began to expose the systems hitherto employed by Mr. Lawson. Mr. Montague thought that by now almost everyone interested in automobilism knew that the patents held by the British Motor Co. were of little or no value. Much bluster was made in the company's advertisements about them, but with the exception of possibly the particular form of carburettor used on a Daimler engine, he did not believe there was any patent which would be infringed by the building of a complete copy of the Daimler car. He further believed that if the rest of the patents held by the British Motor Co. were put up for auction to-morrow, including the patent for blowing a horn off the exhaust, they would not fetch £100. He did not wish to damage the prospects of any trading company, or to interfere with any man's rights, but in the general interests of British automobilism, which had been bluffed and cramped by loud but idle threats of ac-

tions for infringement of alleged master patents, etc., he felt it his duty to speak plainly before such an audience as that of the value and extent of the so-called patents.

The author then went on to criticise severely the formation of the Great Horseless Carriage Co., and pointed out that the Motor Trade Association, of which Mr. Lawson was president, did not represent British automobile manufacturers with any completeness, as such firms as the Daimler, Thornycrofts, and Marchalls are not connected with it, and he went on to say that he questioned if the companies at present belonging to it had ever constructed, sold, and put on the road six carriages with motors of their own manufacture. He referred to Major Crompton's unsuccessful attempt last November to obtain the names of the committee of the Motor Car Club.

With regard to the present aspect and future prospect of British automobilism, they had a more pleasant subject to deal with. The author referred appreciatively to the vehicles for heavy traffic, such as the Thornycroft, Bayleys, Leyland, and Lifu, and expressed his opinion that for vehicles over one and a half tons and not more than three tons unladen the United Kingdom was to all intents and purposes at the top of the tree. With regard to vehicles weighing thirty hundredweight and under, they naturally turned to the Daimler Motor Co.

He considered the directors had done wisely in inspecting the work of Panhard & Lavassor, but they would have been wiser still if they had made up their minds to profit by the experience and brains of the Panhard firm and had secured then, and every spring afterwards, one of the latest Panhard cars and set themselves to copy this until they had succeeded in turning out a carriage as good as the Panhard, and then have set their faces against all attempts of their own at improvement. As it is they persisted too long in turning out carriages with tiller steering, and cars of six horse-power of a ton in weight. However, all this was now changed, and the company were to be congratulated on having turned out the most up-to-date motor carriage in the country.

His own twelve horse-power Daimler, though nearly a year old, was a car of which he felt proud, and the new six horse-power carriage, with aluminum introduced where possible, was another advance. As to the comparisons in workmanship between the British and French cars, from his experience he had come to the conclusion that the British work was the better. He had no doubt the company would benefit greatly by its endeavor to turn out racing carriages, and that the experience they gained would be of great benefit to them.

He spoke appreciatively of the energetic work which the Motor Monufacturing Co. was doing. They were now turning out a number of tricycles on the De Dion system with good results, and had made a specialty of carriages for public services. Personally, he thought they would have done better if they had turned more attention to machines of the Panhard type, and had kept clear of experimenting. Great interest would be centered in the thousand miles trial in respect of the number of "dark horses" which were taking part in it, such as the Simms Wheel, Century, Endurance, and New Orleans and Wolseley voiturettes. The Marshall car was another which he hoped to see still further prove its worth in the trial. He referred in appreciative terms to the Ariel tricycles, the New Napier carriage, which Mr. Edge intended to race in France this year, the Lanchester, the Roots & Venables, and Koch heavy oil (which he understood was to be built in England shortly by a company being formed), and he hoped that the home manufacturers would give attention to the construction of explosive engines of high power in which heavy oil could be used, as there would before long be a considerable opening for their use in connection with military transport. In fact, at the moment Major Crompton was on the look out for such an engine for use in South Africa.

The author gave some details of the Dunlop Co.'s work in regard to tires, and also referred to the New Grappler and Clipper, stating he was glad to note that the latter firm had entered a set of tires for the thousand miles' trial. A tire was being made by Falconet, Perrideaux & Co.

with a vulcanized skin and soft rubber core. He referred to the pleasant running of electric carriages, and regretted their limitations, but looked forward to the time when the practically perfect accumulator would be obtainable. He referred to the slowly changing attitude of the daily press towards automobilism, and said the great drawbacks hitherto to automobile manufacture in this country had been (1) unsound finance and (2) want of practical automobilists on the boards of companies concerned in the manufacture. He felt sure that there was ample scope for honestly promoted and sound companies run by really practical people. The object of his paper had been to state truthfully and clearly the difficulties with which the manufacture of automobiles had been surrounded in this country. Speaking as a member of Parliament, he felt sure that so long as all automobilists did their best to avoid arousing prejudice, and did not make undue efforts to get the laws governing their pastime ameliorated too quickly, they would, when the right time came, meet with no rebuff. He was sure that the House of Commons was much more favorable to the movement today than it was a year ago.

MORE OR LESS AMUSING

AN AUTOMOBILE VAGRANT

"Hello, sarg! This is Kalvelac. Say, tell the loot there's an automobilly up here by the Lincoln school, Belden avenue and Larrabee street. It's been here for hours, and I can't find anybody that owns it. Better tell him to come and take it home."

That was the communication Officer Kalvelac telephoned into the North Halsted street station at two o'clock yestermorning, says the Chicago Inter Ocean. He had discovered an empty and driverless automobile in front of the Lincoln school early in the evening. Thinking the owner was near, he made no investigation. At two o'clock the vehicle was still there and he sent for help from the station.

Lieutenant Stift and two officers responded. They looked the vehicle over, their thumbs in their belts.

"Get in, men," said Lieutenant Stift. "I'll run the machine back to the station and we'll book her on a charge of vagrancy."

The officers got and the lieutenant took his place in the operator's seat. There seemed a confusion of levers and brake handles and meters, and the officer was in doubt as to what they all meant. He pulled one and pushed another and kicked a third, but the carriage stood still.

"If ye'd twist its tail, loot, I think she'd go," suggested one of the officers, poking his head out of the window.

"I've heard that if you put mud in their mouths they'll fairly run away," said Kalvelac, who was leaning against a lamp post and watching operations.

"Mud, nothin'," said the officer at the other window. "Ye should build a fire under him. A nubbin of corn is a gran' thing, too, to start 'em."

The "loot" was kicking and pounding and pulling at everything within reach. Suddenly he struck the right combination. The machine gave a leap like a frightened deer and started backward toward Officer Kalvelac, who promptly shinned up the lamp post. The vehicle dashed across the walk and tried to get into the front door of the schoolhouse. The officers inside were both trying to climb out of one window and Lieutenant Stift was desperately twisting levers. The automobile rushed across the street, took out a section of picket fence and then tried to do a double somersault over a stone horse block.

"I've got her now," said the "loot," as by a rare chance he struck the right lever. He sent the machine humming down the

street. His head was thrown back proudly and the officers inside were just putting their feet up on the seat and getting ready for a comfortable and fashionable spin when two men came rushing around a corner and ordered the operator to stop. They claimed the ownership of the machine. They had been to a surprise party and some boys had stolen the vehicle from its place in front of the house.

A DISADVANTAGE OF AUTOS

The siege of Ladysmith has brought into clear relief one of the disadvantages of the automobile compared with the horse for use in war, says the Chicago Tribune. The automobile cannot be eaten. At the siege there were 5,500 horses and 4,500 mules, and when Dundonald entered the town all of the mules and 4,500 of the horses had been eaten. It is said that the British army were almost entirely without food, the supply being so low that most of the men were faint because of its lack, and 8,000 of the soldiers had been in hospital at one time or another. If the army had been provided with automobiles instead of with horses the supply of food would have been consumed a month or more ago, and the town would have been without defenders now, all being dead from starvation if they had not surrendered. Horses are now being eaten at Mafeking and were eaten at Kimberley. This advantage is one that may not appeal to the horses and their friends with any great strength, but none the less it is real.

FAILURE AND ITS CAUSE

A trial of motor omnibus service was made at New Castle on Tyne and proved a failure, not owing to any trouble with the motive power or any with the buses themselves, but in the transmission mechanism which was altogether too weak. Writing of the subject the engineer of the company says:

"The streets certainly are not the best, but the design of car was unsuitable. In the first place the chain drive is no use at all on wet roads. The spur and bevel gear are too light; the renewals of this cost more than could be taken with the car. The sprocket shaft couplings were a fearful trouble; this I got over by using a new coupling, when I had no further bother with this particular item.

"The first time I looked into the gear box of one of our cars before they started running I began to think there was no five per cent there for motor car shareholders, and my fears have turned out too true. The idea of putting small, fine-pitched wheels to pull a load of nearly two tons eight or nine miles per hour, and a pair of chains with side links and pins out of all proportion to their work on rough roads, the front axle set on two elliptical springs fastened to the frame with half-inch staples instead of being run in horn plates!

"I think it a great pity cars were put on to the passengers' service before they had been properly designed for the same; it has disgusted a great many people with motor cars for public service."

AUTOMOBILES INCREASING

Everywhere in the streets one sees evidence of the constant increase in the number of automobiles—they are doubling, quadrupling, becoming the fad and rage of the hour, says the New York Herald. They have come to stay, too, and if any one were to ask for evidence of the great popular growth of the horseless carriage it is to be found easily. Not only is ocular demonstration at hand, but the great factories of the country are being piled with orders that cannot be filled readily, owing to contracts already placed. A dispatch from Amesbury, Mass., says that a representative of one company in New York alone has placed there orders for from twenty to thirty automobiles per day for the coming six months.

APPARENTLY AN ADVERTISEMENT

When the curtain goes down at the most fashionable performances in Washington, says a dispatch from that city, and the people are streaming through the exits, two remarkably well dressed and attractive looking ladies poise themselves upon the steps and in audible tones ask the caller to summon their automobile.

"Automobile! Automobile! Automobile!" is shouted to the three-quarters. "Coming up, sir," is the reply of the unseen conductor. The horseless vehicle is steered among the prancing carriage teams to the front of the play house, the ladies step inside and away they go before the curious eyes of Washington society. The act is of nightly performance. It is not confined to the theatres, but may be witnessed anywhere that society gathers without invitation. The ladies are unknown to Washington. The part is played so well a suspicion has grown that they "know their business" as well as the automobile people appreciate a good thing in the advertising line.

The Prince of Wales has placed an order for an automobile, a fact which gives great satisfaction to the manufacturers in Great Britain and one which they hope will give a fillip to the trade in that country, which, strangely, is none too good.

An arch surmounted by a reproduction of the latest type of automobile is soon to be erected at the extremity of the Avenue de la Grand Armee, in Paris, to the memory of Lavassor. Lavassor did much to promote the interests of the automobile. This is doubtless the first instance of the introduction of the motor vehicle into sculpture.

The horses used to draw the equipages of the lady whose troops captured General Cronje are being accustomed to the sight of motor-vehicles. Like all well behaved horses, hers showed no fear of the self-propelled vehicles.

A company with a capital stock of $25,000 has been organized for the purpose of establishing an automobile line between Bakersfield and Kern City, Cal.

The irony of it! Funds for purchasing an automobile for sick and injured horses are being raised by the humane society of Newark, N. J.

San Francisco falls into line with an arrest of an automobile driver for invading the sacred precincts of the Golden Gate Park.

With the introduction of the motocycle, says an exchange, the "legocycle" will be relegated to the wheelbarrow class.

Ten thousand cabmen of Naples have gone on a strike to prevent the introduction of auto-cabs in that city.

FROM THE FOUR WINDS

PROSPECTS OF MOTOR SHOW

New York, March 2.—Albert C. Bostwick, the chairman of the committee in charge of the proposed motor-vehicle exhibition next autumn, to be promoted by the Automobile Club of America at Madison Square Garden, was seen to-day by a Motor Age man and gave further and more definite particulars of the plans than were contained in the first announcement in these columns.

Not content with his promotion of the American challenge for the Bennett International cup this hustling young enthusiast has made time to outline plans for the proposed show, which he will put into final execution on his return from his trip abroad to represent the club at the race on June 14.

"Papers and plans are being drawn now," said he, "and it is probable that the show will be held at Madison Square Garden the first week in next November. While it will be a trade show, it will present many of the moving features of the outdoor show held last spring by the Automobile Club of Great Britain. The center space, in which the wheels will be

shown, will be encircled by a track, on which automobiles will be shown in motion and contests in starting, etc., will be conducted. There will also be hill climbing contests on an inclined plane, which proved so popular at the English show. Just what other features there will be in the way of prizes for turnouts and the like after the fashion of the horse show it is too early yet to announce; but, of course, every effort will be made to supply novelties. It is proposed, for instance, to have automobiles of various styles and makes continually on the track for free trial by the visiting public."

PRIZE MONEYS IN FRANCE

Paris, Feb. 20.—No less than $74,396 in prizes has been offered for automobile and cycle races at twelve French meets during 1899. Of this amount, $25,396 has been given to the drivers of autos, being distributed as follows:

Feb. 22-28, Pau	$1,600
March 26-30, Nice	2,000
April 15, Paris-Robais road race	210
May 3, Motocycle Criterion	400
May 10, Voiturettes Criterion	400
May 17, Motor-bicycles Criterion	200
May 23, Paris-Bordeaux road race	2,800
July, Exposition road races	9,400
July, Exposition track races	4,800
July, Exposition objets d'art	400
Sept. 1, Paris-Ostend road race	3,000
Nov. 11, Gaillon Hill	186

WORK FOR GOOD ROADS

New York, March 3.—A. R. Shattuck, chairman of the good roads committee of the Automobile Club of America, had a conference this afternoon at league headquarters with the executive committee of the New York division of the League of American Wheelmen in reference to joint action in the matter of urging the passage of the bill appropriating $1,000,000 for improvement of the highways of this state under the provisions of the Higbie-Armstrong act. Mr. Shattuck in his representative capacity was one of those who appeared before the ways and means committee of the assembly to urge the passage of this appropriation.

The Automobile Club of America has entered the good roads crusade with enthusiasm. The proceedings of the recent good roads meeting, at which noted highway improvement experts and advocates delivered addresses, are now in the printer's hands and a copy of them will be sent every legislator and every newspaper in the state. The report is as concise a summary of good roads argument as has ever been collated.

In addition to these steps, the influential members of the club, which embraces some of the wealthiest citizens of the country, are making individual efforts by personal appeals to the New York legislators.

SUCCESSFUL AUTO-SLED

When the great possibilities of the Klondike gold fields were given such alluring publicity a few years ago, a swarm of inventors appeared with multitudinous devices to overcome the horrors of the winter trail. Everything from reindeer to airships was suggested and more or less prominence was given to the idea of a steam sled. To those unfamiliar with transportation over snow-clad wastes, the airship might have seemed as practicable as the locomotive sled, but the big lumbermen, always on the alert for labor-saving device, had already been experimenting with engines on runners and saw great possibilities in it.

Freeman S. Farr, secretary of the H. C. Akeley Lumber Co., was among the first to give the automobile sled a practical test, and results satisfied him that the idea was worth following up. Last winter the company used a rather crude affair built in the woods, but strong enough to do good work. During the summer a more powerful and better-built locomotive sled was constructed at a city machine shop, and since the weather became cold enough for ice roads, this machine has been doing the work of from ten to fifteen teams. It is employed in the Akeley timber about twenty miles from Park Rapids, Minn.

The automobile sled can haul fifteen sleds of logs. In some cases such a load has been hauled seven miles. In moderate weather this size train can be hauled successfully. In weather at zero and below the train consists of about ten cars.

for the freezing of the runners to the ice while the train is being loaded prevents the starting of more than ten sleds at once. This train has drawn thus far this winter 5,000,000 feet of logs, traveling six miles an hour light, and five miles loaded.

These sleds are coupled together as cars are, and track perfectly, never getting out of line with the runners of the engine. The road is a regular ice road, rutted for the runners as for team hauling. The locomotive consists of an upright stationary engine within a cab, and runs by chains and gearing the two traction wheels in front and two similar wheels behind The water tank with hose for filling on either side of the locomotive. The teeth in the traction wheels take hold of the ice, but do not break it up so as to injure the road. There is a small engine within the cab for steering the locomotive. The locomotive itself rides on runners. In loading the train is not hauled out upon the ice of the lake by the "auto," but is left at the landing to be hauled out by steam, the locomotive returning for another load. Mr. Farr says this is not yet a perfect logging locomotive, but he hopes to add improvements to it so as to make it what he designs it should be, as efficient a means of transportation for logs in winter as the ordinary logging railway is the year round.

AUTO RACING AT L. A. W. MEET

Automobile and motor cycle racing will be features of the L. A. W. national meet at Milwaukee, July 12, 13 and 14. The bicycle runs will be at the cycle track, but on Friday, the 13th, the automobile races for money prizes for professionals and for cups for amateurs will be pulled off at the mile trotting track. It seems not far from probable that these automobile runs may become frequent features of the trotting meets on the grand circuit. Thus ever more will the horse and his enemy lie down in peace together.

AUTOMOBILE CLUB WORK

New York, March 3.—Secretary S. M. Butler of the Automobile Club of America is in receipt of many letters of inquiry from various cities of the United States asking for information and suggestions as to the formation of automobile clubs. Several have already been formed in accordance with the suggestions made by the parent organization.

In its capacity as a national organization of motor-vehicle owners the club bears a parent relation to the individual clubs. It has established reciprocal relations and an exchange of privileges already with the national automobile clubs of Great Britain and Germany, and negotiations are nearly complete for an alliance with the representative bodies of Italy and France. All communications of American clubs to foreign clubs and vice versa are forwarded through it and pass through the hands of its foreign relations committee.

ABSURD CLAIMS

The following statement alleged to have been circulated by a member of the enormously capitalized Anglo-American Rapid Vehicle Co., is going the rounds of the press: "I expect to see the day when men of Philadelphia who do business in New York will ride over in the morning in their private carroages and return in the afternoon. They will make the trip in an hour. Their automobiles will have flanged rubber wheels and will travel on the tracks of the Pennsylvania railroad. Ninety miles an hour will be no speed at all for our new models. They can make that on a dirt road. On steel rails they ought to go much faster."

Even if the statement were true the publication of it would be harmful, rather than helpful to the motor-vehicle industry. It is possible the railroad company might have something to say in regard to the use of its tracks, too.

FURTHER POSTAL TESTS

The experiment of collecting U. S. mails with the aid of motor-wagons is being continued. In the present instance the trials are being conducted in Brooklyn, where the results have proven satisfactory, as they were in Chicago, Buffalo, Washington and Cleveland. The Brooklyn trials will cover a period of a

week or more, covering different districts. The time consumed in collecting over the various routes already covered has been reduced below the schedule of the little covered horse-drawn carts now in use, from forty to fifty percent. Speaking of one of the trials, the Brooklyn Eagle has the following to say:

"The trial was thoroughly satisfactory from the standpoint of time elapsed. The caravan visited considerably over forty letter boxes, the carrier collecting whatever mail there was in each, and completed a circuit of several miles in fifty minutes. Judged by the standard of railway travel on a clear, straightaway track, this may seem slow, but in a fairly crowded section of the city, with intersecting trolley lines and coquettish grocer wagons, the record is remarkable, considering the number of full stops. The regular schedule time for a complete round of the Station B route is in the neighborhood of one and one-half hours. This is the allowance made for the little two-wheeled covered chariots which are now used generally all over town to collect and bring in the mails. They were thought to be a big improvement upon shoe leather, and so they were, but unless the department horses become imbued with a new speed they are bound to go."

A TRIP TO THE KLONDYKE

Two chauffeurs, Janne de Lamarre and Raphael Merville, will attempt to reach Dawson City, in the Klondike, in an automobile, says a Paris dispatch. The two automobilists have no illusions regarding the difficulties of their journey. They know that they will have to traverse 1,200 kilometers of snow and ice, with cold 30 to 40 degrees centigrade.

They left Paris recently en route to Havre and embarked on La Bretagne, full of confidence. Their automobile will be a Voiturette le Bolle, which will pull a sledge behind it when on ice. On the sledge will be placed their supplies and petroleum tricycles of three horse-power.

The Voiturette will be specially arranged so that the front wheels can be transformed into sledge runners, while the pneumatic hind wheels can be replaced by spikes. Voiturettes of this kind already exist in Canada and have been run with great success on ice. The sledge behind also carries a tent, a stove and a hatchet with which to cut wood.

In regard to the provisions, M. de Lamarre, who is accustomed to traveling in those regions, has arranged for a supply being furnished by Indians and mounted police along the route to be traveled. They will carry a number of Winchester rifles and revolvers. From Vancouver to Yukon on the White Pass they will make use of steamship and railway.

The expedition in the automobile will begin at Lake Bennett. The first stop will be at Atlin City. Thence the route will be via Lake Sagua Arm, Lake Marsh, Miles Canon, White Horse Rapids, Fifty Miles River, Lake Lebarge, Lewis River, to Fort Seslaint. From this point they will descend the Yukon to Dawson City, the total distance being 650 miles.

In summer M. de Lamarre intends to mount the motor of the tricycle on a boat and go via Yukon to the Bering Sea.

TESTS OF ACCUMULATORS

The Automobile Club of France has undertaken a series of tests to determine the merits of the various makes of accumulators, in order to find out which are the best for use when subjected to the working conditions of the automobile. To carry out this idea, an installation was made in the basement of the club building, the object being to subject the batteries as nearly as possible to the mechanical and electrical strains encountered en route.

The automobile was imitated by a large wagon-truck upon which was con-

structed a platform for the batteries. The wheels were rubber tired, and were arranged to rest upon four corresponding wheels at the floor-level, the truck being anchored at each end by tie-rods. The lower set of wheels carried a series of projections upon their peripheries and were caused to rotate by an electric motor by means of chain gearing. It will be seen that when the lower wheels are rotated the truck is subjected to a jolting movement which gives the batteries a shaking about the same as they would receive in the vehicles upon the road.

The batteries consisted generally of five or six cells, each in a wood box, which was kept locked by the owner. From the boxes the wires were received by a set of switches overhead, connected with the instrument board provided with the necessary voltmeters, ammeters, and energy-registering instruments. By this means the batteries were charged and discharged according to a certain regime and their performance noted. The points to be observed were: 1. The duration of the elements. 2. Their efficiency, or the relation of the energy given in charging to that furnished on discharge. 3. Conditions of keeping in order, necessary repairs, etc. 4. Weight of the accumulators as compared with their capacity.

The tests were made in periods of six days. The first day the batteries were charged and then discharged in series at the constant rate of twenty-four amperes for five hours, without being subjected to the shaking movement. The voltmeter readings of each were taken, and if the voltage fell below 8.5, the battery was removed from the circuit. After four such withdrawals, the battery was definitely excluded.

During the five other days, the batteries, previously charged, were subjected to the shaking movement, and at the same time were discharged at a variable rate, which was regulated by a revolving commutator turning once every half hour and varying the load from twenty to 100 amperes; this latter current was applied for one-half minute only. Ten revolutions were made by the commutator, and this constituted the test each day, thus imitating the demands which would be made upon the battery by the motor when in actual service.

In the intervals of repose between charging and discharging, the competitors were allowed to examine their batteries, to clean the plates, and keep up the specific gravity of the electrolyte, but were not permitted to make repairs. The above arrangements and rules were made by a committee appointed by the club, of which M. Forestier was president and M. Hospitalier vice president. The tests were begun on the third of June and closed on the second of December.

The official report, as made out by M. Hospitalier, gives a number of interesting figures as to the performance of the accumulators. Eighteen different European makes were represented at the beginning of the test, but of these only eight were able to finish. Of these, the French makes were the Pollak, Tudor, Blot-Fulmen, Fulmen, Phenix, and Societe des Metaux; the foreign makes were the Societa Italiana, of Cruto, using the Pescetto system, and W. Pope & Son, Slough, England, with the Sherrin battery. The details of the experiments and the summing up of results will be made the object of a complete report to be published under the authority of the club at a later period.

FROM FOREIGN FIELDS

TO RACE FROM MUNICH TO VIENNA

The Austrian Automobile Club and the Bavarian Automobile Club have combined in the promotion of a road race to be run from Munich to Vienna via Salzburg, early next June. The prizes will be "objets d' arts." At the conclusion of the race there will be held an exhibition in Vienna. There will be four classes provided for in the race—racing vehicles, touring vehicles exceeding 880 pounds in weight and carrying three persons, vehicles under 880 pounds in weight and motocycles.

AT THE PARIS EXPOSITION

Of the total space of 1,600 square meters (about 17,000 square feet) of space allotted for automobile exhibits at Paris, 1,225 have already been taken, with applications coming in every day. The Automobile Club of France and the Decauville Vehicle Co. have the largest spaces, 100 square meters each, followed by Ferrat, Durracq & Co., Koch and Peugeat Brothers. In the space already taken will be exhibited about 150 vehicles.

MOTOR VEHICLES IN SPAIN

There are about forty motor-vehicles to be found in Madrid, while in the other larger cities like Barcelona, Valencia and Balboa there are also a goodly number. Motocycles are scarce, there being not more than fifty in all Spain. Most of the vehicles are of German make, with a few French ones. The desire is for the latter, but owing to the fact that the French are from eight to twelve months behind on orders the German firms get the trade. Motocycles are just beginning to achieve popularity.

FROM STUTTGART TO HAVRE

Two Englishmen, Campbell Muir, and A. F. C. Hawley, recently made the trip from Stuttgart, Germany, to Havre, France, a distance of 569 miles, in thirty hours. A twenty-four-horse-power Daimler motor-vehicle was used. The following are the times from point to point: Stuttgart to Strasburg (104 miles), 7 hours; Nancy (ninety-six miles), 5 hours; Frere-Champenoise (138 miles), 6 hours; Paris (eighty-two miles), 5 hours; Rouen (eighty-one miles), 4 hours; Havre (sixty-eight miles), 3 hours.

RESTRICTIONS IN RUSSIA

There are many restrictions surrounding the use of motor vehicles in the captal of Russia, none of them, however, very severe. They are as follows:

No vehicle is allowed to be used without a license.

Vehicles are divided into three classes, those (A) for private use, those (B) for passenger traffic, and those (C) for carrying freight.

Classes A and B are allowed on all streets, while those of class C are restricted to a list of streets named in the regulations.

Vehicles of class A are restricted to carrying six persons and those of class B to thirteen, while class C is restricted to a total weight of 8,800 pounds.

Owners of vehicles must furnish the authorities with photographs or drawings of their vehicles, showing that they are equipped with efficient brakes and must give the name of the driver and the place where the vehicle is stored.

The driver must pass an examination, after which the owner is furnished with a plate bearing the number of the license, which must be attached to the vehicle.

In case of change in vehicle the license must be renewed.

Drivers must be at least seventeen years old and subject to no physical infirmity which might interfere with the careful handling of the vehicle.

Each vehicle must be equipped in such a manner that no person, except the one authorized, can start it, and four wheeled

vehicles must not be allowed to stand in the streets without an occupant.

In case of change of ownership of the vehicle the license must be renewed.

The speed must not exceed eight miles an hour.

Vehicles must be provided with two lanterns (motocycles with one), and also a horn.

Vehicles must show no smoke or steam.

DRIVERS' WOES IN PARIS

Baras, the dare-devil motocyclist, was recently fined $40 and sentenced to eight days' imprisonment for having run over and slightly injured a little girl.

Balldeck was fined $1,200 and sentenced to two days in jail for having run into a street car and injured one of the passengers.

Finally, a driver by the name of Vaud has twice been fined in the sum of forty cents and been assessed in damages to the sum of $60 for having run over a Spitz dog.

AUTOMOBILE CLUBS EVERYWHERE

France leads the world in the number of automobile clubs, having no less than nineteen, of which two are in Paris, the Automobile Club of France leading with a membership of 2,200.

Belgium has five clubs.

The Automobile Club of Great Britain is the only one in the United Kingdom, but it has branches in London, Liverpool, Birmingham, Edinburgh, and Dublin.

Switzerland has one club with nearly 300 members.

There are four in Italy, which together form the Italian Automobile Club.

Austria has four clubs.

Germany has one.

Holland has one.

Spain has one.

The United States has two—one at New York and one at Chicago—besides several more in process of formation.

NEWS OF THE TRADE

BICYCLE TRUST TO MAKE MOTORS

Indications are that many cycle manufacturers will begin the construction of motor bicycles and motor tricycles at a comparatively early date. It is admitted that the members of the American Bicycle Company, or cycle trust, are deeply interested in the motor question, and at a meeting held recently it discussed a proposition to adopt as part of their wheel equipment a small motor of English invention, which is constructed for bicycle use.

The motor is the same with which one of their members is already experimenting, and which, it was announced, he would use in the construction of self-propelled bicycles and tricycles of small cost. Some of the members of the trust aver that motor cycling is only entering its experimental stage, and that it may be years before the perfected machine is ready for the market.

The fact that the trust, which includes more than a score of the largest wheel makers in the United States, is considering the application of motors to bicycles is an indication, at least, of the rapid approach of the motocycle era. It is practically assured that at least one maker will begin the manufacture of motor bicycles within a few months in addition to those already turning them out.

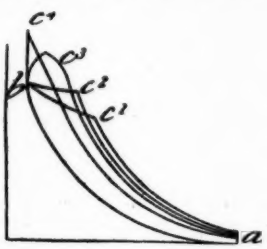
AUTOMOBILE STATIONS SUCCESSFUL

New York, March 3.—So great has been the success of the Automobile Station & Repair Co., whose station No. 1 is at the St. Nicholas Rink, that still another company on the same lines has been established. The Manhattan Automobile Sta-

tion is its corporate title and it has established its storage house on Thirty-second street near Eighth avenue, both streets being asphalt paved and the last named constituting one of the main avenues connecting the city with Central Park, the Boulevard and Riverside drive. Here automobiles may be stored, repaired, washed, cleaned and cared for generally.

THE DIESEL MOTOR

In the Diesel engine, recently described in the Motor Age, in which, it will be remembered, the explosion is produced by compressing the explosive mixture to a point where its heat is below less than that required to produce combustion, and then—the compression being about completed—injecting into the composition chamber a small amount of a mixture having an explosive compression considerably less than that of the ordinary mix-



ture. (The introduction of acetylene gas into gasoline vapor would have this effect.)

The accompanying diagram shows the effect of the introduction of the higher explosive. The line a b represents the curve of the less readily ignitable mixture. If the more readily ignitable mixture be introduced slowly, the result will be a slow spreading of the ignition and a gradual combustion represented by the curve b c1. If the more readily explosive mixture be suddenly introduced, the result will be a sudden ignition and rapid combustion, represented by the curve b c4. The curves b c2 and b c3 represent degrees between these two extremes.

CHICAGO MOTOR FIRE ENGINE

The Fire Extinguisher Mfg. Co. of Chicago, has been experimenting for the past six months on an automobile ladder and chemical engine combination. Several trial trips have already been made with satisfactory results. The company will begin immediately to perfect the machine and put it on the market.

The combination engine will be different from those now in use, in that it will be built with the hook and ladder truck in front and the chemical engine behind. The power used to propel the machine will also be used in hoisting the ladder and for pumping purposes.

This will not be the first time that self-propelling engines have been used in the Chicago fire department. In 1877 the city council authorized the chief of the fire department to purchase a traction engine, so that the power used in propelling the machine could be immediately turned onto the pumps as soon as the engine reached its destination. The first engine was apparently a success, and the next year two were added to the department. About this time the people began to lay in complaints against the use of these engines in the streets, on the grounds that they frightened horses and caused them to run away. The appeal became so general that in 1879 the city council ordered the traction engines dismantled, and since that time they have been pulled about the streets by horses.

"Another objection to the traction engine," said Chief Swenie, "was that we were required to carry 160 pounds of steam all the time, and in summer the heat from it was unendurable."

NOTES OF INTEREST

The Consolidated Motor Vehicle Co. has been incorporated under New Jersey laws with an authorized capital of $100,000, of which $1,000 is paid in.

An English firm is building portable houses for automobiles. They are of light construction, quickly erected, and neat in appearance. For instance, for a runabout a six by eight structure is furnished. The sides are paneled, the interior is lined with felt, the floor is raised slightly above the ground, and a hinged board at the door, turned in when the doors are closed,

forms an incline for the entrance and exit of the automobile.

Collister & Sayle of Cleveland have secured the agency for the Waverly automobiles of the Indiana Bicycle Co.

The Throop Perforating Co., of Buffalo, is working upon a gasoline motor for bicycles. Mr. Throop is equipping a tandem with one and hopes to test it as soon as the streets are passable. The motor can be attached to any bicycle, will weigh about fifty pounds and be of one-half horse power.

L. S. Dow, president of the new National Automobile & Electric Co. of Indianapolis, has petitioned the city for new sidewalks, water mains and sewer pipes to the site of the factory which the company is about to erect at the corner of Twenty-second street and the L. E. & W. tracks.

A BRITISH SYNDICATE desires the *exclusive agency for Great Britain* for one or more fully-developed

Motor Vehicles

preferably of the *gasoline* type.

Would consider nothing of an experimental nature or made by a concern unable to *guarantee prompt shipments.*

Headquarters in London.

Address preliminary correspondence to

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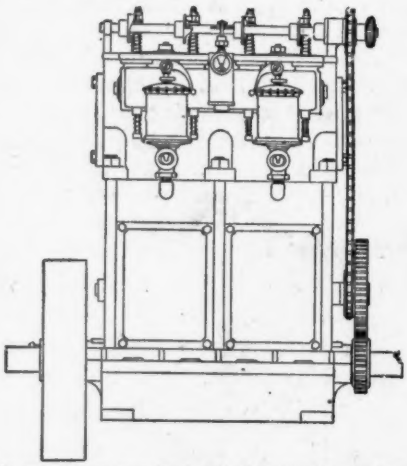

This cut shows our four cylinder, 4½ horse power, non-vibrating, shifting spark, varying the speed from 100 to 1500 revolutions,

Gasolene Vehicle Motor

which we have demonstrated to be the most practical power in the market, occupying a space of 18 x 20 inches, manufactured upright or horizontal; weight, 175 pounds. We build from one to eight horse power. For vehicles, boats and light stationary work, we can prove superiority. Send for catalogue.

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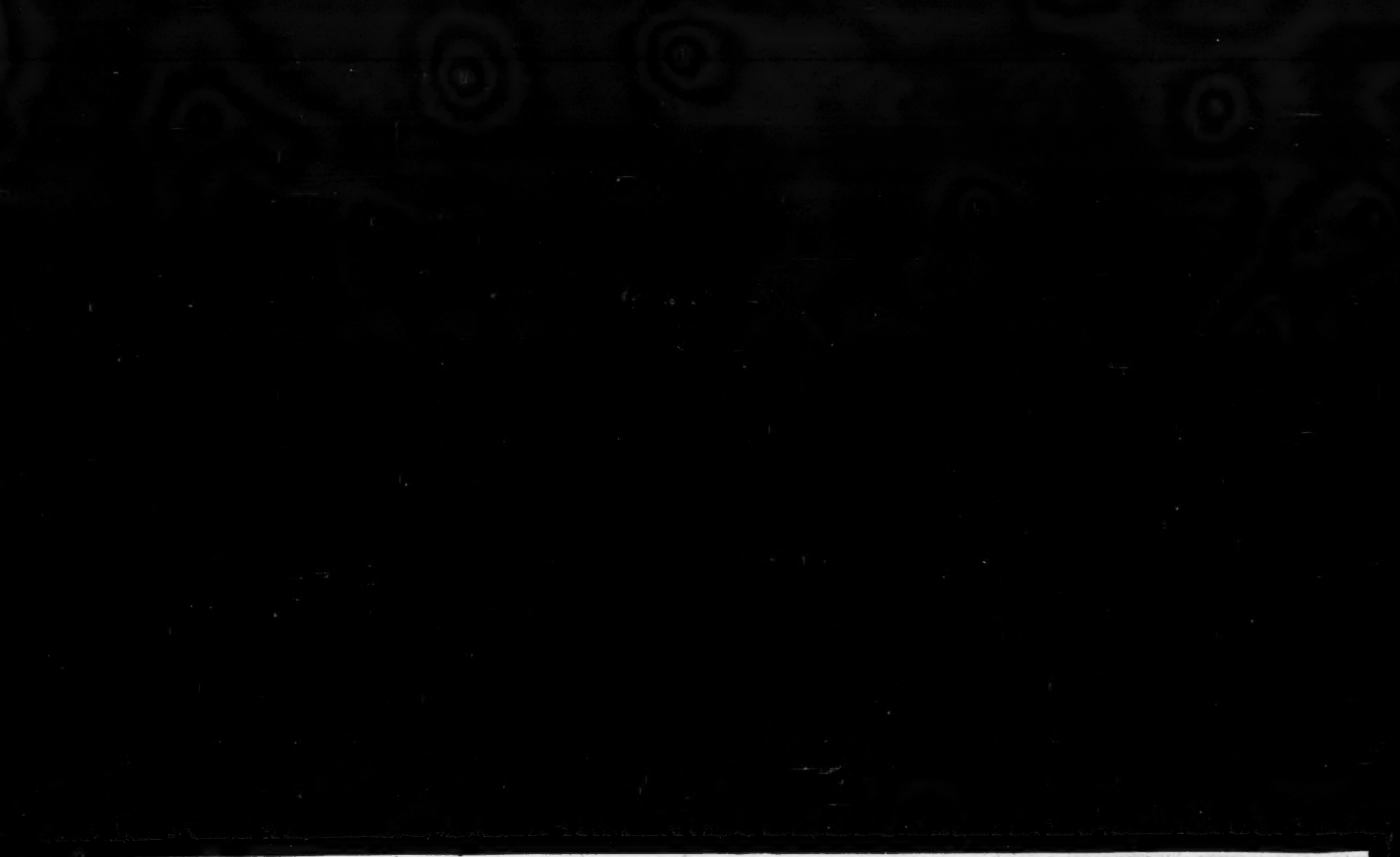
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